REMARKS

Upon entry of the above Amendment, claims 6-9, 36, 37, 41, and 42 will be pending wherein claim 6 is independent. In the above Amendment claims 10, 33-35 and 38-40 are canceled, claims 6 and 7 are amended to even further clearly define the present invention, and new claim 42 is added. Favorable reconsideration and entry of the Amendment is respectfully requested.

In paragraph 3 of the final Office action ("Action"), the Examiner rejects claims 6-10 and 33-41 under 35 U.S.C. § 103(a) as being unpatentable over the Eakins et al. article, Retrieval of Trademark Images by Shape Feature-the ARTISAN Project ("Eakins") in view of U.S. Patent No. 6,801,641 to Eraslan ("Eraslan"), and further in view of Japanese Patent JP 06-215105 to Haruo ("Haruo"). Claims 10, 33-35, and 38-40 have been canceled rendering this rejection moot with regard thereto. Regarding claims 6-9, 36, 37, and 41, Applicant respectfully traverses this rejection.

In order to support a rejection under 35 U.S.C. § 103, the Examiner must establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness three criteria must be met. First, there must be some motivation to combine the cited references. Second, there must be a reasonable expectation of success. Finally, the combination must teach each and every claimed element. In the present case, claims 6-9, 36, 37, and 41 are patentable over the combination of Eakins, Eraslan, and Haruo for at least the reason that the combination fails to disclose each and every claimed element as discussed below.

The present invention relates to searching for an image or sequence of images (still or video image) containing a two-dimensional projection of a specific three-dimensional object of

interest to the searcher. This is done by searching through stored representations of images or sequences of images. The stored representations represent each image or sequence of images using object descriptors for three-dimensional objects in the image or sequence of images. Each object descriptor includes a plurality of perspective view descriptors (associated together to form an object descriptor) which represent different two-dimensional perspective views of the three-dimensional object. The object descriptor includes a view descriptor of the object as it appears in the image (one two-dimensional perspective view) and view descriptors of the object in other two-dimensional perspective views (not appearing in the image or sequence of images). See for example, the different views of the 3-D cylinder object illustrated in Figure 2 of the present application. A search is initiated by inputting a query in the form of an outline which is the outline of the shape of a two-dimensional projection of the specific three-dimensional object of interest to the searcher. An object descriptor for the query object is derived and then compared with the stored object descriptors. More specifically, the query descriptor is compared with each of the plurality of perspective view descriptors in the stored object descriptor. If the query descriptor matches any of the perspective view descriptors, the overall object descriptor is considered a match and the corresponding image or sequence of images is retrieved, even if the perspective view of the object in the query does not match the perspective view of the object in the image or sequence of images. Accordingly, independent claim defines a method of searching for a query object in an image or sequence of images by processing signals corresponding to the images using a processor.

Eakins discusses project (ARTISAN) for the retrieval of images, specifically trademark images, based on shape analysis. According to Eakins, the ARTISAN system is designed to

accept images in a standard format; build a database of image descriptions from the accepted images; extract retrieval features from these descriptions; allow visual queries; and match stored images with the query image. In addition, the extraction of retrieval features includes (a) extracting region boundaries from bitmap images and approximating boundaries by straight-line and circular arc segments; (b) reprocessing boundary representations to remove anomalies cause by noise in the original image; and (c) grouping region boundaries into families (d) construction of envelopes for proximal boundary families; and (e) deriving a set of shape features from an image at three different levels: the entire image, each proximal family, and each individual boundary. The disclosed shape features include as set of 4 features derived directly from each boundary envelope and a set of 5 features derived from individual boundaries within each family. Although Eakins discloses a system for searching for and retrieving similar images based in part on similar between shape descriptors. The shape descriptors of Eakins are not equivalent to the claimed object or view descriptors for the following reasons.

First, the shape descriptors of Eakins are not representative of three-dimensional objects within the stored images. To the contrary, the shape descriptors of Eakins are representative of an entire image, not a two-dimensional projection of a three-dimensional image as claimed. Second, the shape descriptors of Eakins are based on individual boundaries or families of boundaries which extracted from a stored image (i.e., the boundary exists in the image), not different perspective views of a three-dimensional object which are not in the image as claimed.

The Examiner acknowledges that Eakins fails to disclose object descriptors representing three-dimensional objects within an image, each object descriptor includes a plurality of view descriptors representing the outline of the shape of a projection of the three-dimensional object

from a different perspective as claimed. Therefore, the Examiner relies on Eraslan and Haruo to overcome the deficiencies of Eakins. More specifically, Examiner asserts that Eraslan discloses indexing different perspective views of an object and Haruo discloses creating two-dimensional images from three-dimensional geometric shape information. To support this assertion the Examiner points to Fig. 8 of Eraslan and [0042] of Haruo. The Examiner's assertions are unfounded.

Although Fig. 8 of Eraslan illustrates different perspective view of a nose, Eraslan fails to disclose that each of these different perspective views of the nose attribute are stored as part of the object descriptor for the nose attribute. To the contrary, Fig. 8 of Eraslan illustrates the fact that with the face-attribute index (e.g., 01) and the specific face-feature surface code (142), a completely 3-D, color face-feature surface which can be rendered graphically in the frontal view, left-profile view, right profile view and in all possible angled views of observation and analysis. See column 4, lines 35-60 and Figs 7-13. Even if, *arguendo*, one where to equate the shape codes of Eraslan as being equivalent to the claimed view descriptors, the shape codes of Eraslan do not represent different perspective views of the same 3-D object, but entire surface maps for different objects in the facial feature family.

Second, although Haruo discloses creating two-dimensional images from three-dimensional geometric shape information, nowhere in Haruo is there any disclosure or suggestion of storing perspective view descriptors representing the outline of the shape of two-dimensional projection of a three-dimensional object in an image or sequence of images as claimed.

Since the combination of Eakins, Eraslan, and Haruo each fail to disclose or suggest a method of searching for a query object in an image or sequence of images that includes, *inter alia*, providing an object descriptor including a plurality of perspective view descriptors, each perspective view descriptor representing the outline of the shape of a two-dimensional projection of a three-dimensional object from a different perspective view as claimed, the combination of these three references cannot possible disclose or suggest said feature. Therefore, even if one skilled in the art were motivated to combine Eakins, Eraslan, and Haruo, which Applicant does not concede, the combination would still fail to render claim 6 unpatentable because the combination fails to disclose each and every claimed element.

Claims 7-9, 36, 37, and 41 variously depend from independent claim 6. Therefore, claims 7-9, 36, 37, and 41 are patentable over the combination of Eakins, Eraslan, and Haruo for at least those reasons presented above with respect to claim 6. Reconsideration and withdrawal of the rejection of claims 6-9, 36, 37, and 41 under 35 U.S.C. § 103(a) is respectfully requested.

New claim 42 depends from independent claim 6. Therefore, claim 42 is patentable over the prior art of record for at least those reasons presented above with respect to claim 6.

The application is in condition for allowance. Notice of same is earnestly solicited. Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Penny Caudle, Reg. No. 46,607 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By Penny Caudle #46,607
Michael K. Mutter
Registration No.: 29,680
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000